

**REMARKS**

Reconsideration and allowance of this application are respectfully requested in view of the discussions below.

Applicants invention concerns an improved thermal spray coating method for putting a coating layer on the surface of a substrate. A characteristics of the thermal spray coating method which affects the quality of the coating layer is recorded, controlled and monitored by a digital camera. Within the formed images at least one region of equal intensity and/or at least one region within a particular intensity level is assigned to one or more symmetric geometrical surface regions by computer processing. The present invention improves upon the prior art discussed in the background of the invention. A contour detection algorithm or a gradient step representation or a gradient accentuating representation reduced to fit planes operate on these symmetric geometrical surface regions such as circles, square, rectangles, parallelograms, ellipses. These particular surface regions yield data which can control and possibly optimize one or more of the parameters of the spray coating. The result of this analysis is discussed in the specification and includes the ability to detect the functioning of the burner whether it be a plasma burner or the HVOF. Furthermore this data allows for the ability to use these areas of equal intensity as markings for a contour detention algorithm or as gradient steps. As a result information from the entirety of the spray coating method can be reduced to a small amount of information which allows a simple mathematical supported processed diagnostic.

Claims 1, 4, 8-17 and 19 have been rejected under 35 U.S.C. 103 as unpatentable over the reference to Savkar et al. U.S. Patent No. 5,047,612 in view of Hill et al. U.S. Patent No. 5,633,123 for the reasons indicated at item 6 at pages 4-6 of the patent Office Action. Claims 6, 18 and 20 have been rejected under 35 U.S.C. 103 over the above two references and further in view of Bok et al. U.S. Patent No. 5,171,613 as indicated at item 7 on page 7 of the patent Office Action.

Claims 2, 5, 21 and 22 have been objected to as depending upon a rejected base claim but would be allowable if rewritten in independent form.

Applicants respectfully traverse the rejections of claims 1, 3, 4 and 6-20 on the grounds that each of independent claims 1, 12, 16 and 19 provide either a method or structure which contains steps or structural limitations not available from the references or any obvious combination.

The reference to Savkar et al. to U.S. Patent No. 5,047,612 concerns the control of the deposition of a powder in a plasma spray process using infrared imaging to provide the image of the temperature distribution of the deposit and to identify the impact point of the most recent powder deposition.

As indicated at item 6 on page 4 of the patent Office Action, the reference to Savkar et al. '612 fails to mention one or more symmetric geometrical surface regions. Additionally Savkar records images of the deposited layer and not the plasma jet and does not have data processing.

The Article by Lehtinen submitted with the Information Disclosure Statement filed August 25, 2003 shows a recording of images as single light points which, because of recording times of 50 nanoseconds, leads to single

reproduction of each particle. According to the present invention, the images have a repetition frequency of 20 Hertz or a time of 50 milliseconds. As a result, the pictures do not illustrate single particles but an image of the whole display. Lehtinen does not process the data according to the claimed invention.

Additionally, claim 1 is not an obvious variation in light of either of the references of record or the newly cited reference to Lehtinen because none of these references teach one of ordinary skill in the art to record pictures of a plasma jet so that the entirety of the particles provide one bright event and so that a data processing is made whereby regions of the same intensity of this entire display provide a geometrical symmetric area (ellipse) encoded by computer processing.

The secondary reference to Hill '123 concerns a system which extends the useful life of a mask wherein a workpiece uses a debris-blocking layer and a laser is directed toward the workpiece. The mask is provided between the layer and the debris-blocking layer. The workpiece itself is a data storage disk having a substrate and a magnetic coating. According to the statement of the rejection at the top of page 5, column 6, lines 64-67 and column 7, lines 1 to 17 of Hill show one or more symmetric geometrical surface regions by computer processing "because the pattern formed on this layer is capable of forming an optical image in the coating or boundary portion". Applicants submit that the reference to Hill at the quoted portions of columns 6 and 7, is addressed to the optimum image shaping being formed by the high energy source 12 and the buffer layer 16 and that the geometric changes in the energy output determine the image shaping. This is submitted as not being the same as forming an optimum image by

computer processing and furthermore there is no indication that the system of Hill could function in the environment of the plasma spray process of Savkar. It is not understood how the teaching of Hill could be used with the plasma spray process and certainly there is no evidence that any combination would result in the present invention because the present invention, as defined by each of the independent claims, specifically requires not only the capturing of images but also the monitoring of the characteristics of the thermal spray coating which affects the quality of the coating layer and subsequently the assignment of images of equal intensity regions to one of more symmetric geometrical surface regions by computer processing. The device of claim 13 and the computer program product of claim 16 as well as the program storage device readable by a machine of claim 19 each provide the above discussed relationship to a varying degree.

Therefore it is submitted that no combination of the references of record including the reference to Bok et al. would yield the present invention defined by independent claims 1, 12, 16 and 19. Thus Applicants respectfully request that this application containing claims 1-22 be allowed and be passed to issue.

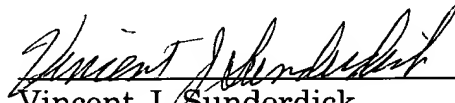
If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

please charge any deficiency in fees or credit any overpayments to Deposit  
Account No. 05-1323 (Docket #218TG/48722).

November 3, 2003

Respectfully submitted,

  
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Vincent J. Sunderdick  
Registration No. 29,004

CROWELL & MORING, LLP  
P.O. Box 14300  
Washington, DC 20044-4300  
Telephone No.: (202) 624-2500  
Facsimile No.: (202) 628-8844

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